

Amendments to the Claims

Please amend claim 20. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

- 1.-19. (Canceled)
20. (Currently amended) An optical correlator having an image production device, an image capture device and an optical device for providing a Fourier transform of a joint image on the image production device at the image capture device, wherein the image production device and image capture device are disposed in a common plane that is perpendicular to a direction of light incident thereon, the optical correlator further having circuitry for applying reference image data and scene image data to the image production device so that scene and reference image data are displayed side-by-side as the joint image, and the optical device is disposed to receive light from the joint image thereby to form a joint power spectrum from the joint image at the image capture device.
21. (Previously Presented) The optical correlator of Claim 20, wherein the image production device and the image capture device are integrated on a common substrate.
22. (Previously Presented) The optical correlator according to Claim 20, wherein the image production device has plural image production elements, the image capture device has plural image capture elements and the image capture elements are interspersed with the image production elements.
23. (Previously Presented) The optical correlator of Claim 20, wherein the image production device has plural image production elements, the image capture device has plural image capture elements and each image production element includes an image capture element.
24. (Previously Presented) The optical correlator of Claim 20, wherein the image production device and the image capture device are spatially separate.

25. (Previously Presented) The optical correlator of Claim 20, wherein the optical device comprises at least one positive power optical device arranged to receive light from the image production device and to pass light back to the image capture device.
26. (Previously Presented) The optical correlator of Claim 25, wherein the positive power optical device comprises a curved mirror.
27. (Previously Presented) The optical correlator of Claim 25, wherein the positive power optical device comprises a planar mirror and a positive power lens.
28. (Previously Presented) The optical correlator of Claim 20, having circuitry for applying reference image data to one part of the image production device, and circuitry for providing reference scene data to another distinct part of the image production device.
29. (Previously Presented) The optical correlator of Claim 20, wherein the image production device is operable to provide phase modulation of incident light according to applied image data.
30. (Previously Presented) The optical correlator of Claim 20, wherein the image production device has two output levels only.
31. (Previously Presented) The optical correlator of Claim 20, wherein the image production device comprises a ferroelectric liquid crystal on silicon spatial light modulator.
32. (Previously Presented) The optical correlator of Claim 20, wherein the image production device comprises one from the group comprising a nematic liquid crystal on silicon spatial light modulator, a pi-cell spatial light modulator and a microelectromechanical systems (MEMS) spatial light modulator.
33. (Previously Presented) A joint transform correlator in which a reference image and a scene image are displayed side-by-side as a joint image, and light therefrom is Fourier transformed to provide a distribution indicative of a Fourier transform of the joint image on an image capture device, the image capture device being constructed and arranged to provide an electrical signal per pixel representative of a quantity of light received at the

pixel wherein the image capture device is integrated on a silicon substrate, and the integrated device further comprises processing circuitry constructed and arranged to compare the electrical signal of each pixel of the image capture device against a threshold, and to provide an output signal per pixel in accordance with the comparison result.

34. (Previously Presented) The joint transform correlator of Claim 33, wherein the threshold is formed from the electrical signals of at least one pixel adjoining the said pixel.
35. (Previously Presented) The joint transform correlator of Claim 33, comprising a pixellated image production device, wherein the processing circuitry is constructed and arranged to provide each output signal per pixel to a respective pixel of the image production device.
36. (Previously Presented) The joint transform correlator of Claim 35, having output circuitry for reading out unprocessed information from each pixel of the image capture device.
37. (Previously Presented) The joint transform correlator of Claim 36, wherein the pixellated image production device is integrated on the same substrate as the image capture device.
38. (Previously Presented) A method of correlating an input image with a reference image, the method comprising:
 - illuminating a joint representation of the input image and the reference image with coherent light to provide a first light beam; and,
 - passing the first light beam to an optical device disposed to provide a second image at a plane, the second image being a Fourier transform of the joint representation of the input image and reference image,
 - wherein the second image is formed co-planar with the joint representation of the input image and reference image.
39. (Previously Presented) An integrated circuit comprising a liquid crystal on silicon spatial light modulator and an image capture device, the spatial light modulator having an array of light modulating elements and the image capture device having an array of light

capture elements, wherein the spatial light modulator is arranged to provide reference image data and scene image data displayed side-by-side as a joint image, and each light capture element is arranged to provide an output representative of a Fourier transform of the joint image picked up by the respective capture element, the integrated circuit further having processing circuitry for each capture element constructed and arranged to process the output of the capture element together with the output of at least a respective one other capture element and to provide a first output from each capture element in response to such processing, the capture array further having output circuitry for outputting the unprocessed output of each capture element.